

## REMARKS

### 1. Amendments

Claim 15 has been amended to help render moot the 37 CFR 1.75(c) rejection regarding claim 16. Claim 15 has been amended to delete the phrase "in an amount in the range of from 0.02% to 10% (w/w) based on the total weight of said sulphur pellet". A similar phrase is present in claim 16 depending from claim 15. Claim 25 has been amended in a manner similar to claim 15.

Claim 31 has been amended to help render moot the 37 CFR 1.75(c) rejection. The phrase "and" in claim 31 has been replaced with an "or".

Claim 37 has been amended to depend from claim 36 to help render moot the 37 CFR 1.75(d)(1) rejection.

New claims 38-42 have been added.

The Commissioner is hereby authorized to charge any required claims fees to Shell Oil Company, Deposit Account No. 19-1800.

### 2. Claim Objections

The Office Action at page 2, paragraph 1, has objected to claim 16 under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. The Office Action indicates that claim 16 does not further limit the amount of hydrogen sulfide suppressant which is claiming. Applicant suggests that the claim objection of claim 16 has been rendered moot by Applicant's amendment of claim 15.

The Office Action at page 2, paragraph 2, has objected to claim 31 under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only. Applicant suggests that the claim objection of claim 31 has been rendered moot by Applicant's amendment of claim 31.

The Office Action at page 2, paragraph 3, has objected to the specification as failing to provide proper antecedent basis for the claimed subject matter. The Office Action indicates that

there is no antecedent basis for the limitation of "a substantial absence of bitumen or aggregate or both" which has been recited in claims 25 and 37 in the specification. Applicant respectfully suggests that claim 25 is an independent claim. Applicant also suggests that claim 37 has been amended to depend from claim 36 that depends from independent claim 1.

### **3. 35 USC §112 Rejection of Claims 1-5 and 36**

Concerning claims 1-5 and 36, Applicant respectfully suggests that there is no indefiniteness in the claim language. Applicant respectfully suggests that it is clear from the reading of claims 1 and 2 that the sulfur content of the claimed sulfur pellet must only be within the claimed percentage range and that there is no requirement that the sulfur content be 100 wt%.

Applicant has also added new claims 38-42 to help render moot the rejection under 35 USC §112.

### **4. The 35 USC §103 Rejections**

The Office Action has presented the following obviousness rejections:

- (1) 35 USC §103 Rejection of claims 1, 3-5, 7-9, and 36 over Etnyre (US 4,756,763) in view of Gaw (US 3,960,585)
- (2) 35 USC §103 Rejection of claims 1, 3-5, 7-9, and 36 over Etnyre (US 4,756,763) in view of Gaw (US 3,960,585) and in further view of Kopvillem et al. (US 3,738,853)
- (3) 35 USC §103 Rejection of claims 10-19, 30, and 35 over AU 9715194 in view of Etnyre (US 4,756,763) and Gaw (US 3,960,585)
- (4) 35 USC §103 Rejection of claims 20-24 over Gaw (US 3,960,585) in view of Etnyre (US 4,756,763)
- (5) 35 USC §103 Rejection of claims 25-29 and 37 over Etnyre (US 4,756,763) in view of Gaw (US 3,960,585)

The prior art relied upon by the Office Action to support the above 35 USC §103 rejections is summarized below. The summary below was previously presented in Applicant's

Amendment filed on January 18, 2008 with the exception of Kopvillem et al. (US 3,738,853) that is utilized by the Office Action for the first time.

#### **AU 9715194 A**

The AU abstract teaches a method involving the heating and mixing of bitumen with hot granular heat exchange material that can be carried out in a pug mill. There is no mention of the use of sulfur and there is no mention of the use of sulfur suppressants.

#### **US 4,756,763 to Etnyre**

Etnyre discloses asphalt compositions that include sulfur, but Etnyre does not teach a composition that is predominantly or close to entirely all sulfur that further has a concentration of a hydrogen sulfide suppressant. The Etnyre invention relates to a method of making and using an asphalt composition. The asphalt and sulfur are combined and made into a solid that may be transported to a remote site where it is heated and mixed with a material to be coated. Etnyre specifically teaches away from the compositions having a high sulfur content in that it states that it is desirable to keep the percentage of sulfur in the mixture to as low as is practical. *See* column 3, lines 55-56. The preferred ratio of sulfur-to-asphalt in the mixture is approximately 2.3:1, on a weight basis, and it should not exceed 4:1. *See, e.g.,* column 3, line 50 – column 4, line 6. A filler may also be added to the asphalt at the same time the sulfur is being mixed with it. *See* column 5, lines 37-56. Examples of the amounts of filler used in the mixture include 28.5% by weight of the mixture, 23 wt%, and 31 wt%. *See* column 5, line 57 – column 6, line 16. This mixture may also further be blended with a significant amount, *e.g.* 82.5 wt%, aggregate material, thus, making the amount of sulfur in the resulting mixture a very small percentage of the total. *See* column 6, lines 50-61.

There is no disclosure or suggestion by Etnyre of a high sulfur content composition that contains a hydrogen sulfide suppressant; and, in fact, the teachings of Etnyre are actually of a low sulfur asphalt-sulfur composition, such as those disclosed that contain a filler or both a filler and an aggregate. There is absolutely no suggestion or teaching by Etnyre of, and, there is a teaching away from, a method involving the formation of high sulfur content pellets with a suppressant

concentration which are formed for the purpose of transporting them to a destination where the pellets are separately mixed with asphalt or aggregate, or both.

### **US 3,960,585 to Gaw**

Gaw teaches a process for casting a composition that necessarily comprises both sulfur and asphalt. This process includes using a hydrogen sulfide suppressant to suppress the formation or evolution of hydrogen sulfide during the preparation and casting of asphalt compositions that contain sulfur. Gaw does not teach the direct addition of a hydrogen sulfide suppressant to sulfur only; and, actually, Gaw teaches against first adding a hydrogen sulfide suppressant to sulfur prior to adding the resulting combination to an asphalt or mineral aggregate or combination thereof. Indeed, Gaw states that it is preferred to add the hydrogen sulfide suppressant to an asphalt component before it is mixed with the sulfur component. *See* column 2, lines 63-65. And, in the preparation of pavement compositions, where the asphalt and aggregate are mixed before the sulfur is added, it is preferred to add the suppressant to either the aggregate, or the asphalt, or the mixture of asphalt and aggregate, prior to the addition of sulfur. *See* column 2, line 65 – column 3, line 4.

A non-preferred sequence of addition is the addition of the suppressant to the asphalt mixture after the addition of sulfur in the mixing sequence. *See* column 3, lines 4-7. Gaw, thus, teaches that it is preferred to add the suppressant separately to the asphalt, or aggregate, or asphalt and aggregate compositions prior to the addition of sulfur to such compositions, and Gaw teaches that it is not preferred to add the suppressant after sulfur is added to any of the asphalt, or aggregate, or asphalt and aggregate compositions. This certainly fails to teach, and, actually teaches away from, the possibility of mixing a suppressant and sulfur pellet with the asphalt, or aggregate, or asphalt and aggregate compositions.

Gaw does not teach a composition that is predominantly or close to entirely all sulfur that further has a concentration of a hydrogen sulfide suppressant. But, Gaw does teach a sulfur-asphalt mixture comprising sulfur, asphalt and aggregate having a weight ratio of sulfur-to-asphalt of at least 1:1 with the preferred ratio being from 2:1 to 5:1. *See* column 3, lines 8-11. The asphalt that is employed in this sulfur-asphalt mixture is an amount sufficient to bind the

aggregate and is generally at least 3 weight % of the total weight of the composition with 4 to 7 wt% being especially suitable. *See* column 3, lines 34-38. The Example 1 composition of Gaw is a sulfur/asphalt/sand mixture respectively present in the weight percentages of 18%, 6%, and 76%. It is noteworthy that a relatively small percentage of the Gaw composition is asphalt, and, this percentage is so small that even if the ratio of sulfur-to-asphalt were to be relatively large, the total percentage of sulfur in the Gaw composition is small.

### **US 3,738,853 to Kopvillem et al. ("Kopvillem")**

Kopvillem Abstract discloses sulfur-asphalt pavements and construction articles that are produced by casting sulfur-asphalt-aggregate mixes in forms without the application of densification pressure. The mixes employed to produce the cast articles have weight ratios of sulfur to asphalt of at least 1:1. Applicant suggests that there is no mention of the use of sulfur suppressants.

### **Argument**

The following Argument section was previously presented in Applicant's Amendment filed on January 18, 2008 and is presently applicable.

The cited prior art references clearly fail to disclose high sulfur content compositions that contain a significant concentration of a hydrogen sulfide suppressant. And, in fact, the prior art references actually teach away from such compositions or their use in the formation of materials containing asphalt and sulfur used with aggregate materials that can be formed or used as a paving material. There is absolutely no suggestion in the prior art teachings that a sulfur pellet with a hydrogen sulfide suppressant may be formed at a separate location than which an asphalt composition is formed and where the sulfur pellet is added.

The composition of the sulfur pellet of independent claim 1 is not disclosed or taught by the cited references. No combination of the references teach a composition that is predominantly or close to entirely all sulfur and which further has a concentration of hydrogen sulfide suppressant. The compositions of independent claims 20 and 25 use either the partially closed transitional language "consisting essentially of" or the negative language "having a substantial

absence of' to make it clear that the sulfur composition or pellet excludes the substantial presence of bitumen or aggregate, or both. With these limitations, it is absolutely clear that the claimed compositions are patentably distinguishable over the prior art.

Concerning the process claims, for example, independent claims 10, 15, and 30, the claim language clearly establishes that separate sulfur compositions or pellets are formed independently of certain of the recited steps of preheating or mixing of the bitumen and aggregate and that the sulfur compositions or pellets are similar to those recited in the composition claims of the specification.

## **5. Additional experimental results**

The Declaration under 37 CFR 1.132 of inventor Imants Deme indicates additional experimental results.

## **6. Conclusion**

Applicant respectfully requests reconsideration and withdrawal of the Office Action rejections. Applicant further respectfully requests entry and consideration of the Declaration under Rule 37 CFR 1.132 of inventor Imants Deme. Applicant further respectfully requests entry and consideration of the above amendments and remarks to advance the above-identified application to allowance.

Respectfully submitted,

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